## Crime Rushes in the Wake

WARS have invariably been followed by crime waves, sociologists find, and the increasing offences in England since the Great War have led students there to believe this last war will be no exception to the rule.

According to a writer in "The Regina Daily Post":

"The subject has been dealt with in a scientific manner by a German criminologist, Dr. Erich Wulffen, judge of a district court, so long ago as October, 1915. He points out, however, that the influence of war on the criminality of a people cannot be judged until from two to five years after the war. According to statistics, the total of all crime decreases during a war in all nations, and this, Dr. Wulffen shows, is proved in a striking manner by the French and Prussian criminal statistics of 1870-'71. Beginning with the very year after that war, the figures again reached the point where they had been before, and continued to increase appreciably during the next three to five year. Then they dropped again to the ante-bellum ratio.

"Influences of war on criminality, Dr. Wulffen holds, become distinctly perceptible, and become stronger in proportion to the length of a war, and for that reason we must expect a considerable increase in criminality in all the belligerent nations after the war. This authority discusses the question of weapons. He observes:

"'As the criminal does not himself invent any weapon, but simply makes use of war weapons already tested, we shall probably witness after the war a more widespread use by criminals of the new weapons brought forward in the present conflict.'

"Dr. Wulffen discusses another interesting question as to whether there will not be an evil influence on the criminality of children whose fathers have been participators in the war, born after or during the conflict. This may well be the case, he contends, if the fathers have gone through nerve-shattering horrors. When it is considered that in the present war the millions of soldiers at the front representing 10 per cent of the population were exposed for a long period to the effects of warlike experiences which far exceed in violence and nerve-shaking characteristics, the question is one of great importance. Definite conclusions cannot be reached on incomplete statistics or taken over too short a period. The greatest panacea for all social disturbance naturally is the gospel of work."

### Snake Bites

Snake bite caused 23,918 deaths in British India in 1917, nearly 300 more than in 1916. There were 2,176 persons killed by wild animals, 102 less than in 1916. Tigers got 1,009; leopards, 339; wolves and bears, 280; elephants and hyenas, 89. Of the 456 set down to "other animals," 89 are assigned to pigs, and 199 to crocodiles.
—*Popular Science Monthly.*

# Our One Hundred Per Cent Navy Leviathan

THE battleship New Mexico is called by scientists "practically the only 100 per cent electric boat." Recently completed in the Brooklyn Navy Yard, she is now travelling the seas, an object of never-ending interest to electric engineers.

A writer in "The Electrical Experimenter" points out some details of the new battleship:

"This latest leviathan weighs 32,000 tons and requires 32,000 horsepower, or one horsepower per ton. Her weight is equivalent to a bar of iron weighing one pound to the foot and forming a band of iron from the North to the South Pole with enough in addition to reach from Maine almost to the borders of Florida. She is so huge that it requires ten tugs to push her from her pier in Brooklyn Navy Yard out into the East River. From the platform called the 'crow's nest' at the top of the mast down to the level of the water is 120 feet, or equal in height to a ten-story building.

"The battleship can generate enough electricity to run the giant General Electric Works and the Schenectady Railway Company.

"Like everything else that is electrical, the New Mexico is the cleanest institution of her kind. There are no engines or turbines connected with the propeller shafts—only electric motors. There are no grates under the boilers—merely oil burners. There is not a coal or ash shovel on the ship; nor are there any cinders, smoke, dust or soot.

"The New Mexico 'coals' through a 6-inch hose; that is because she burns only oil for her power. The total oil capacity of the dozen or more compartments is 3,400 tons, or 6,800,000 pounds, or nearly a million gallons. If the New Mexico were an automobile with a mileage of twenty miles per gallon, this amount of oil would drive her close to 20,000,000 miles, or a distance equal to eighty times to the moon. But a 32,000-ton battleship does not equal the mileage of a flivver, for it weighs as much as 60,000 of those vehicles and must plough through the water, displacing her own weight of water each time she runs her own length—624 feet. The cost of fuel is more important on shipboard than on land, and this is emphasized by the fact that on the 2,000-mile trial trip she will displace over 620,000,000 tons of water."

### *Oil Fuel Burned*

Oil fuel is burned, passing through various processes until the energy drives the propellers electrically. James Watt, throughout his life, opposed any steam pressure higher than five or ten pounds to the square inch. It is interesting to note that the New Mexico's boilers supply steam at 250 pounds per square inch. After the steam is generated and drawn from the boiler it is again brought into contact with the flames of the furnace and heated to a temperature of 450 degrees F., or hot enough to melt solder and tin.

Continuing:

"For propulsion there are two electric power plants in separate compartments. They are way down low in the New Mexico close to the boilers. Each of these power plants alone is able to drive the battleship at a speed of 18 knots. (A nautical mile or knot is 6,080 feet, as against 5,280 feet in a land mile.)

"In two separate steel compartments 15 by 45 feet are located the two turbine generator sets, each not over 27 feet long. The turbine itself is little larger than a hogshead of molasses laid over on its side. It seems almost incredible that this small machine can generate 16,000 horsepower from steam.

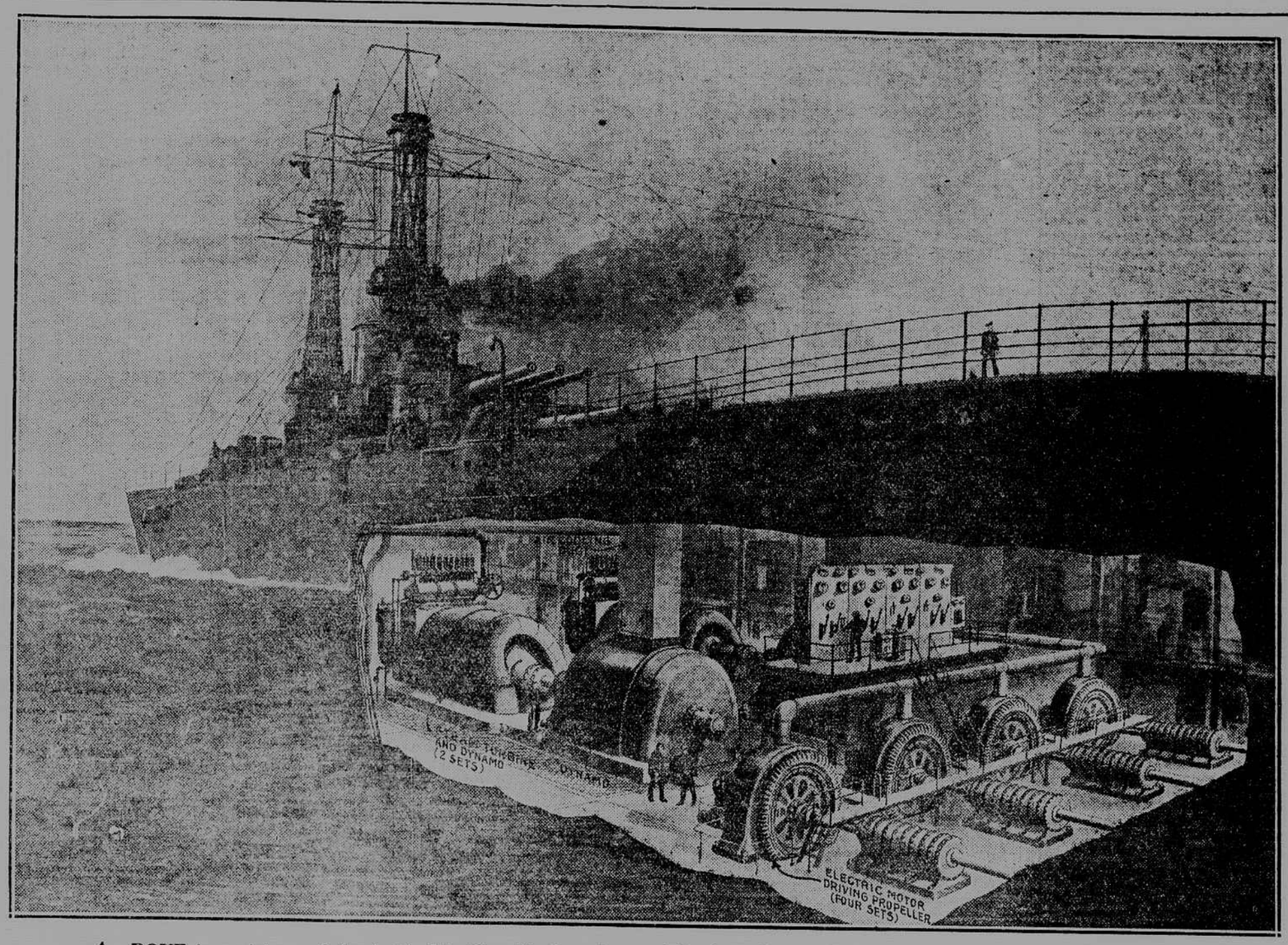
"The engine rooms of most ships of the past have been a tangle of bending and curving pipes, and in order to move about the men had to stoop down to go under them or climb over them or squeeze between them. When one of these pipes burst it practically meant the death of every man in the engine room. One of the advantages of these power plant rooms in the New Mexico is the fact that there is only one steam pipe in the room, and that is only sixteen feet long.

"In each of these two power plants the steam turbines make electricity for driving the battleship. From the outside the most interesting thing about these wonderful rotary steam engines, called turbines, is their small size, their light weight, and the fact that they are so perfectly inclosed that you cannot see anything move. A turbine of 16,000 horsepower when compared in size and weight with the great triple and quadruple expansion steam engine that had been used until recent years is practically a watch charm—a little toy. There is only rotary motion in the steam turbine."

### *Captain's Orders*

Instructions from the captain may be sent either by loud speaking telephones, by indicators, by lights or by messenger. Following these instructions, the engineers standing at the switchboard "can start the vessel forward or start it backward; they can make it go many different speeds in either direction; they can run all four of the motors from one of the power plants or from the other power plant; they can even split up the load, so that one power plant will run two of the motors forward and the other power plant will run the other two astern. Another combination they can effect is that both power plants can equally share the load of driving the four motors—one to each propeller."

### *An Electric Driven Superdreadnought*




**ABOVE is a picture of the battleship New Mexico, the world's first electric driven superdreadnought. It is driven as easily as a hotel guest rings for ice water though its machinery is more complex. The illustration discloses the appearance of the 32,000 horsepower electric generating and propelling plant of this great fighting ship. There are two steam-turbine driven generating plants and the four propelling screws are worked by four electric motors. They are controlled from the switchboard shown in the above picture and when desired may be driven from the bridge or pilothouse of the war vessel.**
—Courtesy *The Electrical Experimenter.*

## Know How Your Ears Work?

A NEW and interesting theory as to the origin of hearing has been propounded by Professor A. Keith at the Royal Institute, London. This theory, says a writer in "The English Mechanic and World of Science," owes its origin to investigations made by Sir Thomas Wrightson over forty years ago—"and further pursued by him when, after a long political career, he returned to his early preoccupation. Sir Thomas, who was not satisfied with the theory of Helmholtz as to the incidence of sound waves and the mechanism for conveying them to the brain, showed that instead of one signal for each wave there must be four. In 1904 Sir Thomas had asked the lecturer certain abstruse questions about the internal structure of the ear, and in order to answer them Professor Keith undertook an investigation in which he had to deal with most delicate membranes measuring from one one-hundreth to one one-thousandth of an inch, and forming parts of an intricate system.

"To show how nature had proceeded to the perfecting of the instrument he illustrated as its foundation the balancing arrangement by which fish get their ideas of orientation and keep in equilibrium. This was elaborated in the ear so that waves of sound could set up signals by pressure and tension on the cells just as the movements of the balance did in the fish. Nature introduced an extension of the original system and added the lever and the drum, the effect of which was to magnify sound and make hearing more sensitive. But even without the drum hearing was still possible to a modified extent.

"The most wonderful innovation was the basilar membrane with a shelf for a most delicate machine that recorded sound waves, and, by means of a piston, conveyed their vibrations to the primitive cavity, the fluid in it being thereby displaced. This was the essential mechanism of the organ of hearing, and by its operation any energy in the cell was carried through the nerves to the brain. The discoveries of Englishmen, said the lecturer, were generally overlooked while they were living, but Sir Thomas Wrightson's theory of sound transmission was of such importance as to deserve recognition. The sounds were sorted out by a series of resistances, and the theory of hearing was thus brought into line with that of sight and other sensations."

### A New Fuel

Liquids and solids do not ordinarily mix, and the idea of combining coal and petroleum to make a new fuel sounds rather chimerical at first, says "Popular Mechanics." Yet that very thing has been done, and successfully, by pulverizing the coal so finely that it forms a colloidal or suspended mixture with oil. This compound passes freely through all regular oil pipes and burners, so that it can be used for power and heat without equipment change; and it generates a greater heat value than oil alone.

# The Lesson of the Date Palm—How Science Has Applied It

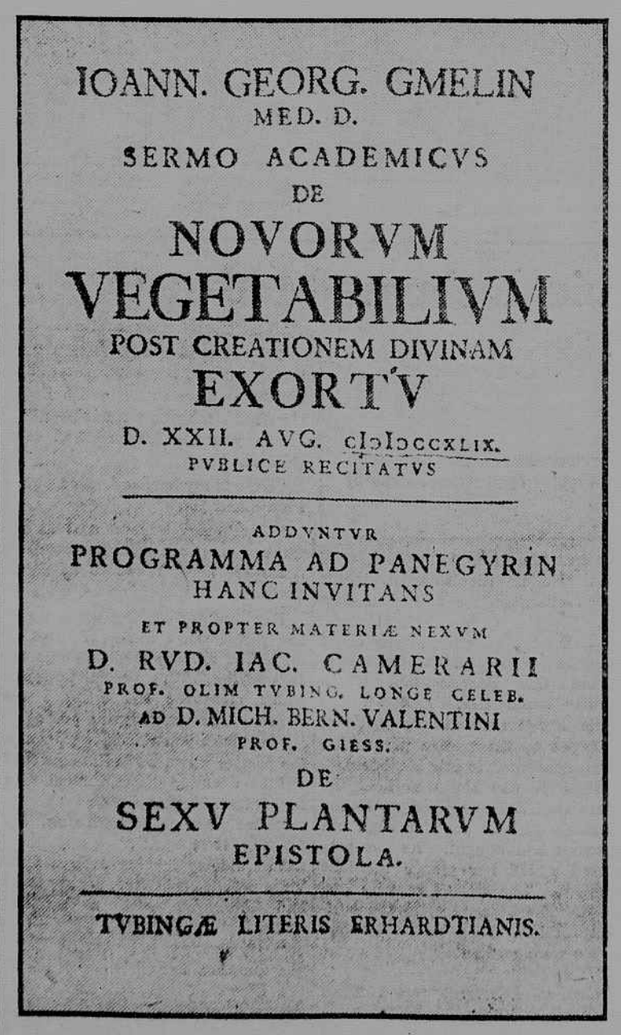
NO ONE can tell precisely when men first began the cultivation and domestication of plants and animals they found about them, according to a writer in "The Journal of Heredity." But it seems certain that the earliest home of civilized man on earth was in the lower basin of the Tigris and Euphrates rivers, in southeastern Asia, the site of the Biblical "Garden of Eden," known locally to-day by the Arabic name of "Iraq."

The history of the date palm, the writer declares, typifies, better than that of almost any other plant, man's relation to the plant world as a moulder of its cultivated forms. A Babylonian hymn, quoted by both Pliny and Strabo, prescribes 360 uses for the plant, and as late as the thirteenth century Marco Polo, the celebrated traveller, speaks of "a great city called Bastra, surrounded by woods, in which grow the best dates in the world."

It was learned in that early day that date palms were of two sexes, as the writer remarks:

"The Babylonians understood that the date palms were of two sorts, male and female by nature, and they utilized this knowledge in a practical way by resorting to artificial pollination of the female trees in order to make them bear more abundantly. We also know that the Arabs have continued this practice uninterruptedly to the present time. Indeed, they seem to have had a distinct understanding that the date palm possessed sex in the same sense in which it exists in the animal kingdom.

"Kazwini, who died about 682 A. D.,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ET PROPTER MATERIÆ NEXVM
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PROF. OLIM TVBING. LONGE CELEB.
AD D. MICH. BERN. VALENTINI
PROF. GIESS.
DE
SEXV PLANTARVM
EPISTOLA.
TVBINGÆ LITERIS ERHARDTIANIS.

**Title page to Camerarius' "De Sexu Plantarum Epistola"**
—From *The Journal of Heredity*

and to whom reference has already been made, says plainly in his book, 'Of the Marvels of Nature, and of the Singularities of Creating Things,' 'the date has a striking resemblance to man, through the beauty of its erect and slender figure, its division into two distinct sexes, and the property, which is peculiar to it, of being fecundated by a sort of union.'

"However, the lesson which the date palm might have taught men—that all plants possess sex, and hence that breeding can be conducted with them as with animals—appears to have been lost. Even in those regions where the date was grown, the idea which the long-continued practice of artificial pollination ought to have suggested—that it was possible to breed and improve other plants in like manner—seems never to have arisen. One would naturally suppose that the ancient Babylonians, having learned the art of artificial crossing in the case of one plant, would have applied the same process to others."

### *Ages Passed*

The writer explains that their failure to do so is in a measure explainable. No other important plants with which they came into contact showed a similar striking division into two distinct sexes. There was no Indian corn, in which pollination is a conspicuous fact.

Continuing:

"Ages of oblivion had rolled over the land where nature taught men their first lesson in plant breeding. Nearly all that we commonly call the history of the world had taken place. On August 25, 1694, in his laboratory in the University of Tubingen, in South Germany, Rudolph Jacob Cameror, professor of natural philosophy, better known to science under his Latinized name of Camerarius, finished the writing of an extremely long letter to his friend, Professor Michael Bernhard Valentin, of the University of Giessen.

"This extraordinary letter, which fills some fifty printed pages, is entitled 'De Sexu Plantarum Epistola.' It recounts at length, not only the knowledge, slender enough though it was on this subject, which existed up to his time, but gives a full description of Camerarius' now extensive experimental work.


**R. J. Camerarius**

"It is almost incredible, but it is a fact, that this constitutes the first piece of actual scientific investigation into the question of the existence of sex in plants that had ever been made since the date palm had thrown out its first plain and single suggestion more than 7,000 years before."

While the Greek and Roman writers, among them Aristotle, Pliny and Theophrastus, had commented upon the supposed sex in plants, citing the date palm as an example, it is apparent from the many contradictory statements made by each that they carried on no experiments to determine the facts. This Camerarius did, as the writer avers:

"He was the first botanist to discover by actual experiment that the pollen is indispensable to the fertilization of the seeds and that the pollen-producing flowers or plants are therefore male, and the seed-bearing ones female, in nature."

### *Some Experiments*

He conducted his experiments with spinach, hemp and hops, in which the pollen and seed-bearing plants are distinct, and with Indian corn or maize. He was likewise the first botanist to discover, 200 years after maize had been introduced in Europe from America, that on removing the pollen-bearing flowers from the tassel of an isolated corn plant the seeds on the ears remain unfertilized.

The outcome of his experiments led him to the following conclusion regarding sex in plants:

"They behave indeed to each other as male and female and are otherwise not different from one another. They are thus distinguished with respect to sex, and this is not to be understood, as is ordinarily done, as a sort of comparison, analogy, or figure of speech, but is to be taken actually and literally as such."

The result of this pioneer experimental work and that which has come after has led to "plant breeding," which strictly means the production of new types of plants as the result of crossing. It in turn involves a knowledge of sex and the behavior of hybrids. On the subject of hybridization Camerarius wrote:

"The difficult question, which is also a new one, is whether a female plant can be fertilized by a male of another kind, the female hemp by the male hops; the castor bean from which one has removed the staminate flowers through pollination with the pollen of Turkish wheat (maize); and whether, and in what degree altered, a seedling will arise therefrom."

In this fantastic paragraph is summed up the fresh spirit of a new era of scientific investigation. Camerarius himself seems never to have tried the artificial crossing of plants, and it was a full hundred years before his discovery regarding sex in plants received any recognition whatever, and before we find the first recorded instance of an actual experiment in hybridization.

### Clever Kitty

A WRITER in "Scribner's" offers a new defence of the cat, couched in the following expression:

"A cat is master of that most subtle of the arts, reserve. Neither shyness nor bashfulness is his; humility dwells not in him, and modesty touches him with but ineffective fingers. For modesty connotes two factors: a slender confidence in self and an inner restraint from thrusting oneself forward. Neither belongs to the cat. In our own race only the Scotchmen have glorified reserve and made a national trait of reticence, for canniness implies the wisdom of withholding expression. The Scotchman has claimed and won honor for his limitation in expression. Not so the cat. Calumny has fallen upon him, and he is made to wear the adjectives 'stealthy' and 'selfish' and 'treacherous.' We are apt, in our large-minded way, to call reserve treachery when we do not understand it. And we never, in our large-minded way, will understand the cat. Though caution and wariness tingle on his whiskers, his half-closed eyes are focussed on some distant, unseen world, and enmesh his reserve with a sense of mystery. Inscrutability veils the expression of his eyes, something secret and occult vibrates in the atmosphere, and unseen forces which are at once close and remote baffle our perplexed and cumbrous understanding."